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PTO/SB/05 (4/98)
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UTILITY PATENT APPLICATION TRANSMITTAL

(Only for new nonprovisional applications under 37 C.F.R. § 1.53(b))

Attorney Docket No.	I-1-50.5US
First Inventor or Application Identifier	Kaewell, Jr. et al.
Title	BASE STATION EMULATOR
Express Mail Label No.	EL381054340

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

ADDRESS TO: Assistant Commissioner for Patents
Box Patent Application
Washington, DC 20231

1. [X] * Fee Transmittal Form *(e.g., PTO/SB/17)*
(Submit an original and a duplicate for fee processing)
2. [X] Specification [Total Pages 18]
(preferred arrangement set forth below)
- Descriptive title of the Invention
- Cross References to Related Applications
- Statement Regarding Fed sponsored R & D
- Reference to Microfiche Appendix
- Background of the Invention
- Brief Summary of the Invention
- Brief Description of the Drawings *(if filed)*
- Detailed Description
- Claim(s)
- Abstract of the Disclosure

3. [X] Drawing(s) *(35 U.S.C. 113)* [Total Sheets 6]
4. Oath or Declaration [Total Pages]
   a. [ ] Newly executed (original or copy)
   b. [X] Copy from a prior application (37 C.F.R. § 1.63(d))
   (for continuation/divisional with Box 16 completed)
   i. [ ] DELETION OF INVENTOR(S)
   Signed statement attached deleting inventor(s) named in the prior application, see 37 C.F.R. §§ 1.63(d)(2) and 1.33(b).

NOTE FOR ITEMS 1 & 13: IN ORDER TO BE ENTITLED TO PAY SMALL ENTITY FEES, A SMALL ENTITY STATEMENT IS REQUIRED (37 C.F.R. § 1.27), EXCEPT IF ONE FILED IN A PRIOR APPLICATION IS RELIED UPON (37 C.F.R. § 1.28).

5. [ ] Microfiche Computer Program *(Appendix)*
6. Nucleotide and/or Amino Acid Sequence Submission *(if applicable, all necessary)*
   a. [ ] Computer Readable Copy
   b. [ ] Paper Copy (identical to computer copy)
   c. [ ] Statement verifying identity of above copies

ACCOMPANYING APPLICATION PARTS

7. [ ] Assignment Papers (cover sheet & document(s))
8. [ ] 37 C.F.R.§3.73(b) Statement *(when there is an assignee)* [ ] Power of Attorney
9. [ ] English Translation Document *(if applicable)*
10. [ ] Information Disclosure Statement (IDS)/PTO-1449 [ ] Copies of IDS Citations
11. [X] Preliminary Amendment
12. [X] Return Receipt Postcard (MPEP 503) *(Should be specifically itemized)*
13. [ ] * Small Entity Statement(s) *(PTO/SB/09-12)* [ ] Statement filed in prior application, Status still proper and desired
14. [ ] Certified Copy of Priority Document(s) *(if foreign priority is claimed)*
15. [X] Other: Certificate of Mailing By Express Mail and Associate Power of Attorney.

16. **If a CONTINUING APPLICATION,** *check appropriate box, and supply the requisite information below and in a preliminary amendment:*
[X] Continuation [ ] Divisional [ ] Continuation-in-part (CIP) of prior application No: 08/796,973
Prior application information: Examiner T. Bocure Group / Art Unit: 2731

For CONTINUATION or DIVISIONAL APPS only: The entire disclosure of the prior application, from which an oath or declaration is supplied under Box 4b, is considered a part of the disclosure of the accompanying continuation or divisional application and is hereby incorporated by reference. The incorporation can only be relied upon when a portion has been inadvertently omitted from the submitted application parts.

17. CORRESPONDENCE ADDRESS

[ ] Customer Number or Bar Code Label (Insert Customer No. or Attach bar code label here) or [X] Correspondence address below

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	VOLPE and KOENIG, P.C.				
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Name (Print/Type)	C. Frederick Koenig III, Esquire	Registration No. (Attorney/Agent)	29,662
Signature		Date	7/19/99

Burden Hour Statement: This form is estimated to take 0.2 hours to complete Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, Patent and Trademark Office, Washington, DC 20231 DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Box Patent Application, Washington, DC 20231.

Express Mail Label No.: EL381054340
PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the **PATENT APPLICATION** of:		
	Kaewell, Jr. et al.	Our File: I-1-50.5US
Application No.:	Not Yet Known	Date: July 19, 1999
Filed:	Not Yet Known	
For: BASE STATION EMULATOR		
Group:	Not Yet Known	
Examiner:	Not Yet Known	

PRELIMINARY AMENDMENT

Box Patent Application
Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

Prior to the initial Office Action, the applicant respectfully requests that the application be amended as follows.

IN THE SPECIFICATION

On page 1, line 27, before "BACKGROUND OF THE INVENTION", please insert

--Cross Reference to Related Applications

This application is a continuation of Application No. 08/796,973, filed on February 7, 1997, which is a continuation of Application No. 08/588,073, filed on January 17, 1996, now U.S. Patent No. 5,625,653, which is a continuation of Application No. 08/347,835, filed on December 1, 1994, now U.S. Patent No. 5,495,508, which is a continuation of

Application No. 08/104,322, filed August 9, 1993, which is a continuation of Application No. 07/438,618, filed November 20, 1989, now Abandoned, which is a continuation of Application No. 07/123,395, filed November 20, 1987, now U.S. Patent No. 4,935,927.--

On page 6, line 6, after "44." insert --The control unit **44** includes selecting means **45**, monitoring means **46** and assigning means **47**.--

IN THE DRAWINGS

Approval of an amendment to enclosed Figure 1 as indicated in red is respectfully requested.

REMARKS

By this Preliminary Amendment, applicant amends the specification and seeks to amend drawing Figure 1 to conform with the amendments made in the parent application. Approval of the drawing amendment is respectfully requested.

Respectfully submitted,

Kaewell, Jr. et al.

By _____
C. Frederick Koenig III, Esquire
Registration No. 29,662
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CFK/ras
Enclosure

Cont. Express Mail Label No. EL381054340
~~Cont. Express Mail Label No. EM457705887~~
~~Express Mail Label No. EM215477004~~

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION FOR LETTERS PATENT

Inventors	:	John David Kaewell, Jr. : 2810 Woodbridge Road : Philadelphia, Pa. 19114
	:	Scott David Kurtz : 104 West Blubell Lane : Mount Laurel, N. J. 08054
Invention	:	BASE STATION EMULATOR
Attorney	:	Arthur A. Jacobs : Trachtman, Jacobs & Beck : Suite 1908 : Pennsylvania Building : 1500 Chestnut Street : Philadelphia, PA 19102 : (215) 569-9800 : (Registration No. 16,976)

TO ALL WHOM IT MAY CONCERN:

Your petitioners, John David Kaewell, Jr., a citizen of the United States of America, residing in the County of Philadelphia, State of Pennsylvania, whose post office address is 2810 Woodbridge Road, Philadelphia, Pennsylvania 19114 and Scott David Kurtz, a citizen of the United States of America, residing in the County of Burlington, pray that Letters Patent may be granted to them for the improvement in BASE STATION EMULATOR, as set forth in the following specification.

BACKGROUND OF THE INVENTION

In general, present day telephone systems are increasingly using wireless technology for long distance calls and, in some instances, have begun the use of digital technology; however, no system in general use today has been capable of

providing effective and efficient wireless digital technology for local calls to and from individual subscribers. Such technology has been disclosed in various recent patents commonly owned by the present applicants' assignee, as, for example, in U.S. Patent No. 4,644,561, dated February 17, 1987 and U.S. Patent No. 4,675,863, dated June 23, 1987. The technology disclosed in these patents provides base stations in communication with both a central office and a plurality of subscriber stations utilizing digital wireless time division circuits wherein there are repetitive sequential slot positions in a transmit channel bit stream, each slot being associated with a particular subscriber.

The base stations used in the above time division system are relatively complex and expensive but economically feasible for a large system serving a large number of subscribers; however, for relatively small systems serving a relatively small number of subscribers it may be economically infeasible. In addition, such a system utilizes a pair of frequencies, one for transmission and one for reception, and, in view of the limited amount of channels available in the spectrum, it would be highly advantageous if only one frequency could be effectively used.

It is, therefore, an object, of the present invention to provide what may be called a simulated or emulated base station which can be effectively substituted for an actual base station in certain situations.

Another object is to provide a system that can be utilized for plural subscribers but which is operable on only a single frequency.

Other objects will become apparent from the following description and claims:

SUMMARY OF THE INVENTION

In essence, the system of the present invention utilizes what is, in effect, a modified subscriber station to act as a simulated or emulated base station, thereby considerably decreasing the total cost and complexity of the system. This emulated base station essentially differs from the subscriber station only in being able to initiate the synchronization process, whereas the subscriber unit only acts to scan the RF signals sent out by the emulated base station until it finds the frequency and slot assigned to it. In the intervals between transmissions of the RF signals the emulated base station is adapted to receive RF signals from the subscriber units. In this manner, the subscriber unit may either talk to the emulated base station which then acts as another subscriber station, or it may talk to another subscriber station that has been synchronized therewith by the emulated base station.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a block diagram showing an overall system embodying the present invention.

Fig. 2 is a diagramatic illustration of the RCC waveform used in the standard base station.

Fig. 3 is a diagramatic illustration of the RCC waveform used in the present invention.

Fig. 4 is a diagramatic illustration showing the positive edges of the amplitude of the received signal used in course synchronization of the present invention.

Fig. 5 is a block diagram of the circuit for obtaining course synchronization in the present invention.

Fig. 6 is a block diagram of the received AGC circuit used in the present invention.

Fig. 7 is a block diagram showing the frequency acquisition circuit used in the present invention.

Fig. 8 is a diagramatic illustration of a wireless phone system configuration embodying the present invention.

Fig. 9 is a diagramatic illustration similar to Fig. 8 but showing a dual subscriber system.

Fig. 10 is a diagramatic illustration of the frame format of the dual subscriber system of Fig. 9.

Fig. 11 is a diagramatic illustration of the frame format of a plurality of dual subscriber systems.

Fig. 12 is a diagramtic illustration of a system embodying the present invention which is used for monitoring one or more functions.

Fig. 13 is a diagramatic illustration of a repeater system embodying the present invention.

Fig. 14 is a diagramatic illustration of a system embodying the present invention utilizing multiple repeaters.

Fig. 15 is a diagramatic illustration of a system embodying the present invention where a single repeter is used to drive a plurality of other repeaters as well as subscriber units.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The overall internal operation of the system, generally designated 10, is shown in block diagram form in Fig. 1. In this system, during a telephone conversation, a person speaks into the telephone 12 and the speech signal is sent to the local telephone interface unit 14. The signal is digitized by the codec 16 and the resultant digital data stream is then fed to the speech processor 18 which compresses the speech data to a lower data rate. The compressed data is then fed to the modem 20 via line 22 and double-throw switch 24, the modem acting to convert the data stream to a spectrally efficient analog signal. This analog signal is fed to the radio 26 via line 28. The radio upconverts the signal to a radio frequency (RF) signal and then transmits this RF signal via the antenna 30.

In the intervals between transmissions of the RF signals, the unit is adapted to receive RF signals from a subscriber unit. The radio 26 downconverts each of these RF signals to an IF signal and feeds this IF signal to the modem 20 via line 32. The modem 20 demodulates the IF signal to form a digital signal which is then fed to the speech processor via switch 24 and line 36. The speech processor thereupon acts to expand the signal to a digitized speech signal and this digitized signal is then fed into the codec 16 which outputs an analog speech signal to the telephone 12 via the telephone interface 14.

The data transmission mode is similar to that described above except that the telephone is replaced by a data

terminal or computer 38 and the telephone, codec and speech processor are bypassed by means of the alternate position of the switch 24 that is then coupled to the terminal 38 by lines 40 and 42.

The modem 20 and radio 26 are both coupled to a control unit 44. The control unit 44 is initially set to a predetermined slot, modulation and training mode for the modem and to a predetermined RF frequency and power level for the radio. However, these parameters can be adjusted by the subscriber unit in the event they are not adequate to provide a satisfactory reception at the subscriber station.

In a system utilizing an actual base station, such as, for example, the system described in the aforesaid Patent No. 4,675,863, the transmitted waveform is divided into a multiplicity (i.e. 45) msec. frames. Each frame is, in turn, divided into four 11.25 msec. slots. The base station transmits on all four slots to produce a 100% duty cycle modulation waveform, the lone exception being the radio control channel (RCC). The RCC slot is slightly shorter than 11.25 msec and this causes a small gap in the modulation at the beginning of every frame. This gap is known as an AM hole. A diagram of the waveform of the RCC channel in the actual base station format is shown in Fig. 2. In the system of the present invention, however, there is no transmission of a 100% duty cycle waveform. Instead, there is a transmission on only one slot per frame (a 25% duty cycle waveform), as shown in Fig. 3. This modified frame format necessitates changes in coarse synchronization, automatic gain control (AGC) and frequency acquisition. These changes are indicated in the following description:

Coarse Synchronization

Since the system of the present invention utilizes only a 25% duty cycle waveform, it monitors the amplitude of the received signal and searches for positive edges in the amplitude signal. These positive edges are illustrated in Fig. 4. The subscriber unit adjusts its frame timing to align with the occurrence of these positive edges.

The circuit for obtaining the above type of coarse synchronization is shown in block diagram form in Fig. 5 where the received signal is shown as being fed into an amplitude computation device 50 which produces a computer amplitude signal that is then passed to a comparator 52 where it is compared to a predetermined threshold signal, thereby forming a digital signal (1 = signal present, 0 = no signal present). This digital signal is fed into an edge detector 54 that outputs a strobe to indicate the detection of a positive edge.

AGC

The 25% duty cycle modulation requires a distinct type of receive AGC circuit which avoids tracking when there is no signal present. A slow rise fast decay AGC is, therefore, provided. This is shown in Fig. 6 where the received signal is fed into an amplitude computation device 56, which may take the form of a pre-programmed ROM, from which a resulting amplitude signal is fed into a comparator 58 in which it is subtracted from a predetermined threshold value to form a difference signal. This difference signal is fed through one of two scaling multipliers, shown at 60 and 62, into a low pass filter

comprising an adder 64 and a delay means 66 connected through a loop 68. One or the other of the two multipliers is used in accordance with the sign of the difference signal. If the difference signal is positive, the slow decay in the AGC control signal is implemented. If the difference signal is negative, a fast rise in the AGC control signal is implemented. The output of the filter is the gain signal which is then fed to the gain control unit 44 shown in Fig. 1.

Coarse Frequency Acquisition

Since in the 25% duty cycle frame format it is not required to perform frequency acquisition during the off time (75% null time) and since the frame timing is not known at the time when frequency acquisition is performed, a modified form of frequency acquisition circuit has been provided, as shown in Fig. 7. In this circuit the received signal is fed into a Discrete Fourier Transform (DFT) computation device 70 which outputs the high band energy (energy in the frequency band above the center frequency) and the low band energy (energy in the frequency band below the center frequency). The high band energy output is subtracted from the low band energy output at the adder 72 and the output thereof is fed to a mixer or multiplier 74. The received RF signal is also passed to a stripping means 76 which strips off the sign of the signal (negative or positive), thereby determining only the amplitude of the signal. The stripped signal is then fed to a filter 78 which smooths the signal by averaging it out. The output from the filter 78 is fed, via amplifier 80, to the multiplier 74.

The primary purpose of the circuit through 76, 78, and 80 is to prevent the action of noise on the output signal while accentuating the signal itself. In this respect, since noise generally has a small amplitude, it is effectively filtered out during the smoothing process. On the other hand since the actual signal generally has a relatively large amplitude it is, in effect, highlighted by adding the smoothed or filtered signal to the mixer 74.

The scaled signal leaving the mixer 74 is balanced between the high and low energy frequencies, and this balanced signal, that is proportional to the short term average amplitude of the received signal, is fed into a lowpass filter comprising an adder 82, and a delay means 84 which are looped at 86. The delay means 84 causes the output signal 88 to the VCXO control to represent the output immediately prior to the output actually fed into the lowpass filter. The VCXO control is used to adjust the frequency of the master oscillator in the system.

After initial or course synchronization has been effected, the system is in an idle voice mode but is fully set up for voice operation. If the phone at either end goes off-hook, the phone at the other end will ring until the ringing phone is answered or the initiating phone goes on-hook.

The calls are set up by a voice code word (VCW) at the beginning of every voice slot, this code word indicating an off-hook condition at the initiating station. When this occurs, the station acting as an emulated base station then appears to itself go off-hook to the central office (CO) thereby making a connection to the central office. The initiating subscriber

station then proceeds to complete the call by dialing the desired number. When the initiating subscriber unit goes on-hook, the emulated base station is so informed by the VCW and presents an on-hook appearance to the central office.

When the emulated base station detects a ring signal from the central office, the subscriber unit is caused to ring by means of the corresponding VCW from the emulated base station. When the subscriber unit thereafter goes off-hook, the emulated base station is so informed via the corresponding VCW and it then presents an off-hook appearance to the central office.

The above type of wireless phone system configuration is exemplified in Fig. 8 where the subscriber unit 90 is shown in wireless communication via antennas 92 and 94 with the emulated base station 96. The station 96 is in wireline communication via line 98 and interface 100 with the central office.

Dual Subscriber System

The above-described system can be employed with a dual subscriber arrangement as shown in Fig. 9. In this system each channel is capable of supporting two complete conversations without the necessity of using a duplexer. In this respect, a dual subscriber unit 102 is connected by wires 104 and 106 to a pair of subscriber telephone sets 108 and 110. The subscriber unit 102 is in wireless communication via antennas 112 and 114 with an emulated dual base station 116. The unit 116 is connected to the central office by wire lines 118 and 120.

The two separate subscribers 108 and 110 utilize a time slot arrangement, such as disclosed in the aforesaid Patent No. 4,675,863, wherein each subscriber is assigned a separate slot. The frame format for this arrangement is shown in Fig. 10 where four slots are shown, numbered 1, 2, 3 and 4. the first two slots are used for the emulated base station and the last two are used for the two subscribers.

A plurality of dual subscriber systems may be operated on different channels without duplexers by synchronizing all of the emulated base station transmissions. This is illustrated by the frame format shown in Fig. 11 where channel 1 is shown above and channel n (indicating any desired number of channels in between) is shown below. On each channel, the first two slots are for transmission and the last two are for reception.

Paged Remote Service

One emulated base station may be used with a plurality of different subscribers, one at a time. In such arrangement, for reception, the subscribers continuously monitor the transmissions of the radio control channels (RCC), described more fully in the aforesaid Patent No. 4,675,863, until a particular subscriber is paged by the emulated base station by means of the subscriber's ID Number (SID). After receiving a page, the subscriber initiates a transmission back to the emulated base station using the synchronization process described above. For initiating a call, the subscriber transmits on the RCC using the previously described synchronization process.

Monitoring Function

The present system may be used for monitoring one or more functions. In this respect, using a computer as a controlling/data logging device, a plurality of subscribers may be periodically polled to report on some function such as temperature, weather conditions, security, water/flood warnings, low fuel warnings, remote gas, electric or water meter readings, etc. This is illustrated in Fig. 12 where an emulated base station 122 is in wireless communication with a plurality of subscriber units respectively designated 124, 126 and 128. The unit 122 is in wire line connection with both a telephone 130 for voice communication and a computer or data terminal 132 for data input. Similarly, each subscriber unit is connected both to a respective telephone 134, 136 or 138 for voice communication and to a data device, as at 140, 142 or 144 respectively.

Repeater System

An important use of the present system is as a repeater to extend the range of the system. In this arrangement, the emulated base station may be used to overcome interfering obstacles such as mountains and the like. Fig. 13 illustrates this function, showing a subscriber unit 146 in wireless communication with an emulated base station 148 on the summit of a mountain. The unit 148 is also in wireless communication with a standard base station 150 connected to a central office.

The relative simplicity and inexpensiveness of the emulated base station makes it very cost effective as a repeater unit. It can also be used as a repeater to extend the long distance range of the system regardless of the presence or absence of obstructions. By utilization of the time slot arrangement, the repeater unit, without the use of any duplexer, fits into the complete system while remaining transparent to both the standard base station and the subscriber. It can, of course, also be interposed between the subscriber and another emulated base station instead of a standard base station. This can be provided in multiple stages from one emulated base station to another to greatly increase the range of the system in a relatively inexpensive manner. This is illustrated in Fig. 14 where a series of repeater units 152 are interposed between the subscriber 154 and the base station 156.

In addition to extending the range of the system, the repeater unit serves to clean up the actual base station signal via equalization before retransmission to the subscriber.

One repeater can also be used in what may be termed a repeater star system to drive multiple repeaters and/or subscribers. This is illustrated in Fig. 15 where the single repeater unit 158 is in wireless communication with ancillary repeaters 160 and 162 as well as with one or more subscribers such as at 164. The ancillary repeaters are themselves in wireless communication with subscribers such as shown at 166, 168, 170, 172 and 174 as well as with other ancillary repeaters such as at 176. Any one of the ancillary repeaters, such as repeater 162, may be used as the final repeater in direct communication with the base station indicated at 178.

Multiple repeaters may be placed at one location, on different channels and synchronized so that their transmissions and receptions occur simultaneously, thereby avoiding the use of duplexers. In such a configuration, a master repeater is used to monitor the RCC channel of the base station and relays the monitored information to the various subscribers via the emulated base station's RCC. In such a configuration, on call setup, the subscribers are each assigned a repeater channel.

THE INVENTION CLAIMED IS:

1. A wireless digital telephone system comprising

at least two stations in communication with each other by means of RF frequency channels comprising waveforms divided into a multiplicity of frames, each frame comprising a single slot;

means at said station to monitor the amplitude of a received signal and to search for positive edges in said signal;

means at said stations to adjust their frame timing into alignment with said positive edges as they occur;

a first one of said stations being capable of initiating frame synchronization between said stations, and each other of said stations being capable of scanning the RF signals transmitted by said first station until it determines the channel and frame assigned to it;

said first station being adapted to receive RF signals from said other station in the intervals between transmissions of its own RF signals.

2. The system of claim 1 which includes a slow rise, fast decay automatic gain control (AGC) circuit which avoids tracking in the absence of a signal.

3. The system of claim 2 wherein said slow rise, fast decay AGC circuit comprises

an amplitude computation means into which a received signal is fed and which outputs an amplitude signal;

a comparator for receiving said amplitude signals and substracting it from a predetermined threshold value to form a difference signal; and

means to determine the positive or negative sign of said difference signal to selectively implement a slow decay or a fast rise in the AGC signal.

4. The system of claim 1 including a course frequency acquisition circuit, said circuit comprising

computation means which separates a received signal into high band and low band energy frequencies;

means to subtract the high band energy output from the low band energy output to obtain a resultant signal;

means to strip off the sign of the resultant signals to determine only the amplitude thereof; and

means to accentuate the stripped signals while substantially filtering out noise.

5. The system of claim 1 wherein said first station is in communication with a central station.

6. The system of claim 5 wherein at least one of said other stations is coupled to a plurality of subscriber units; each of said subscriber units being assigned a separate slot.

7. The system of claim 6 wherein said first station is provided with monitor means to periodically poll said subscriber units to report on a predetermined function.

8. The system of claim 1 wherein said first station is in wireless interposition between at least one of said other stations and a station serving as a base station to form a repeater unit.

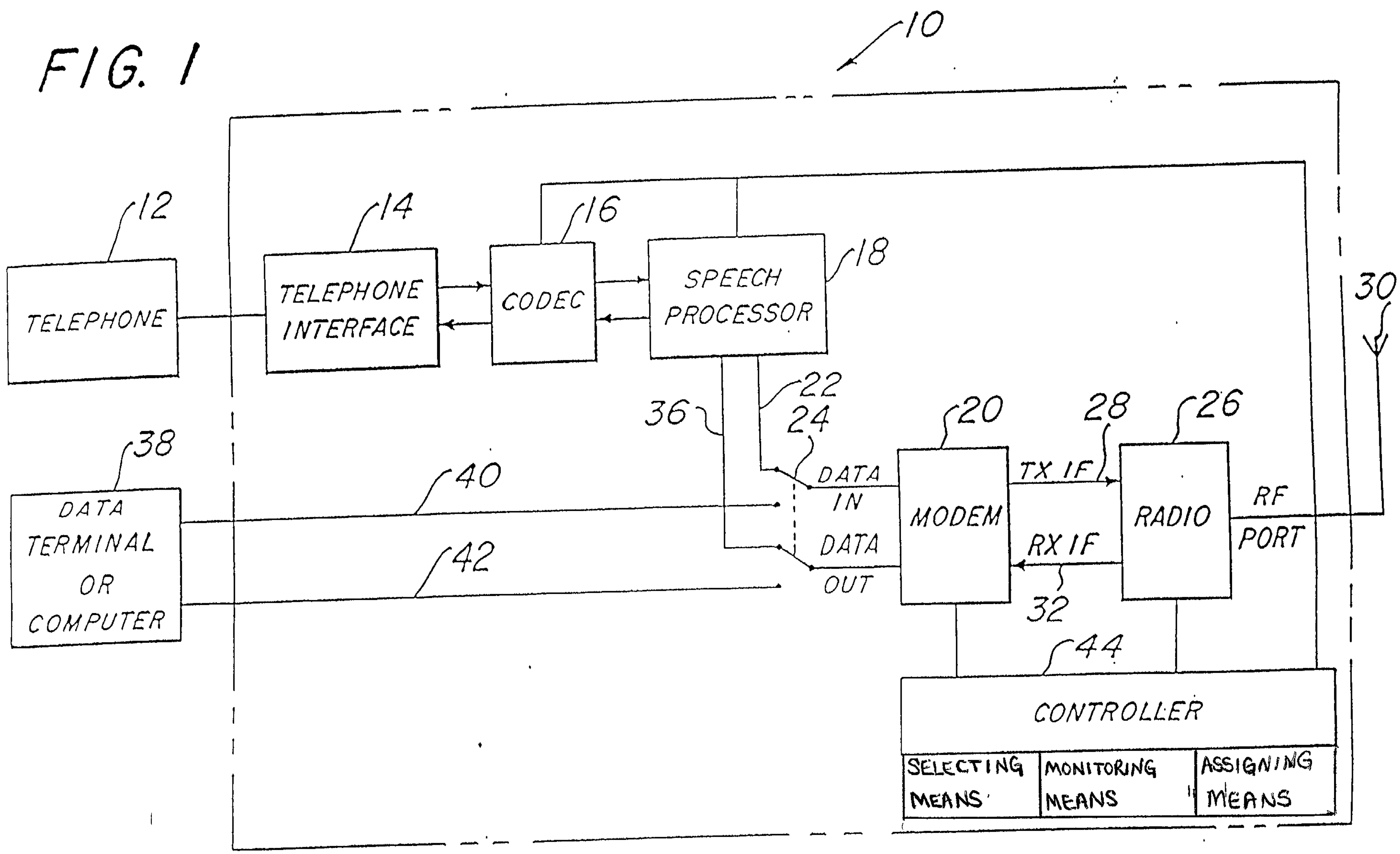
9. The system of claim 8 wherein said first station is in wireless communication with a series of similar stations, each acting as a base station by initiating frame synchronization, the last station in said series being in wireless communication with at least one of said other stations.

10. The system of claim 8 wherein said first station is in wireless communication with a plurality of similar stations, each acting as a base station by initiating frame synchronization, each of said similar stations being in wireless communication with at least one of said other stations, said other stations being subscriber stations.

ABSTRACT OF THE DISCLOSURE

A wireless digital telephone system containing at least one emulated base station plus one or more subscriber stations, the emulated base station comprising a station similar to the subscriber station but having the capability of initiating a synchronization process whereby it is enabled to assign time slots to the subscriber station within the frame pattern of an amplitude signal by means of monitoring for positive edges in the signal.

FIG. 1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12
TELEPHONE
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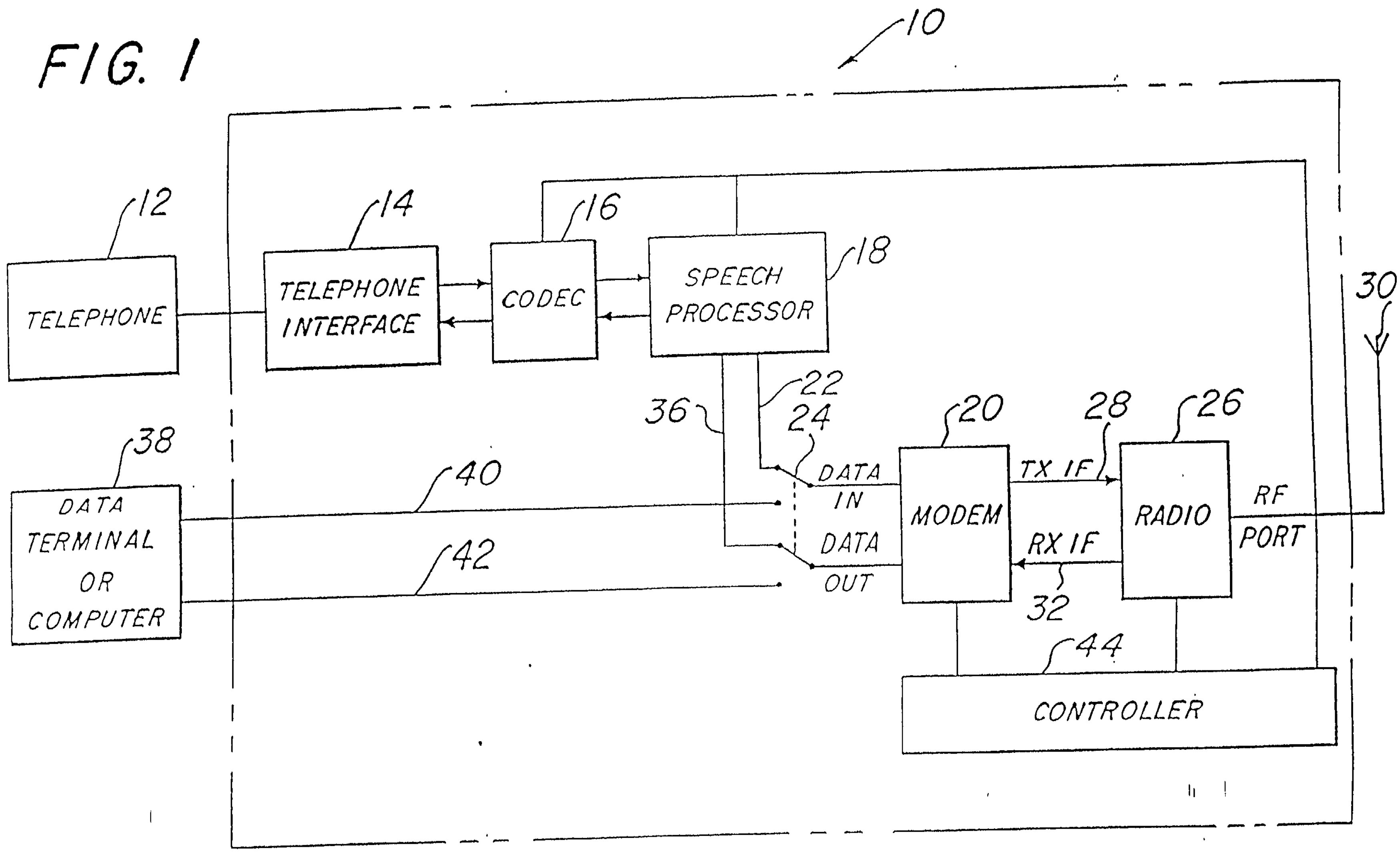
TELEPHONE INTERFACE
16
CODEC
18
SPEECH PROCESSOR
22
24
36
DATA IN
DATA OUT
20
MODEM
28
TX IF
RX IF
32
26
RADIO
RF PORT
30
38
DATA TERMINAL OR COMPUTER
40
42
44
CONTROLLER
SELECTING MEANS
MONITORING MEANS
ASSIGNING MEANS

FIG. 1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12
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RADIO
TX IF
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OR
COMPUTER
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CONTROLLER

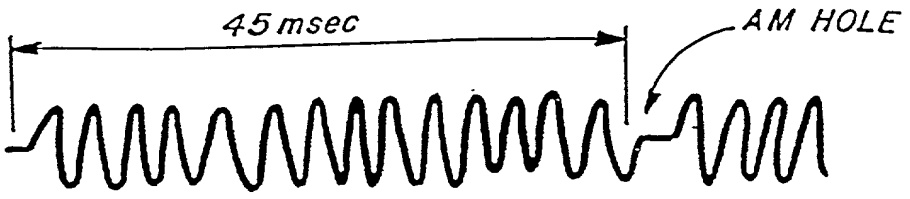


FIG. 2

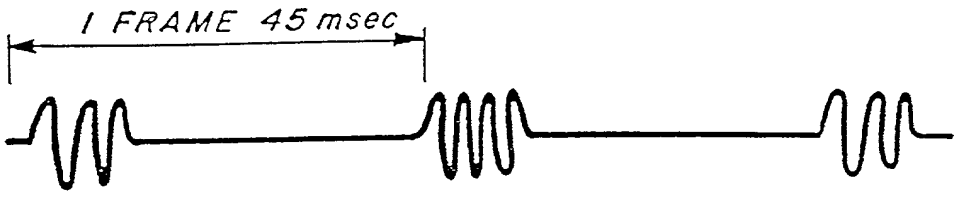


FIG. 3

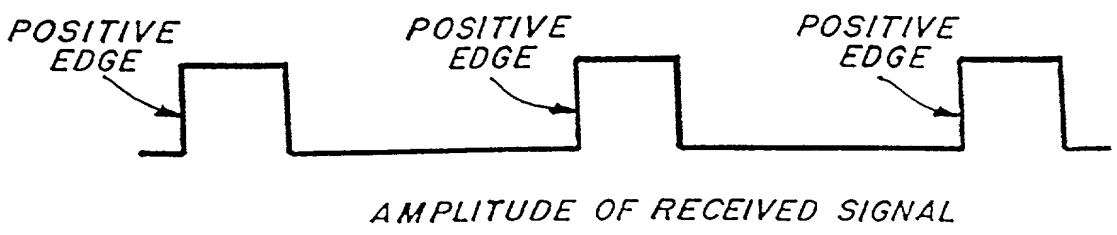


FIG. 4

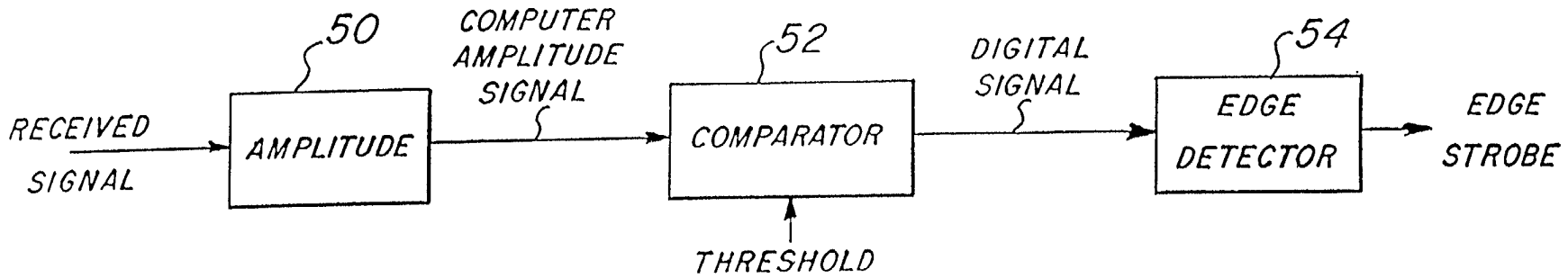


FIG. 5

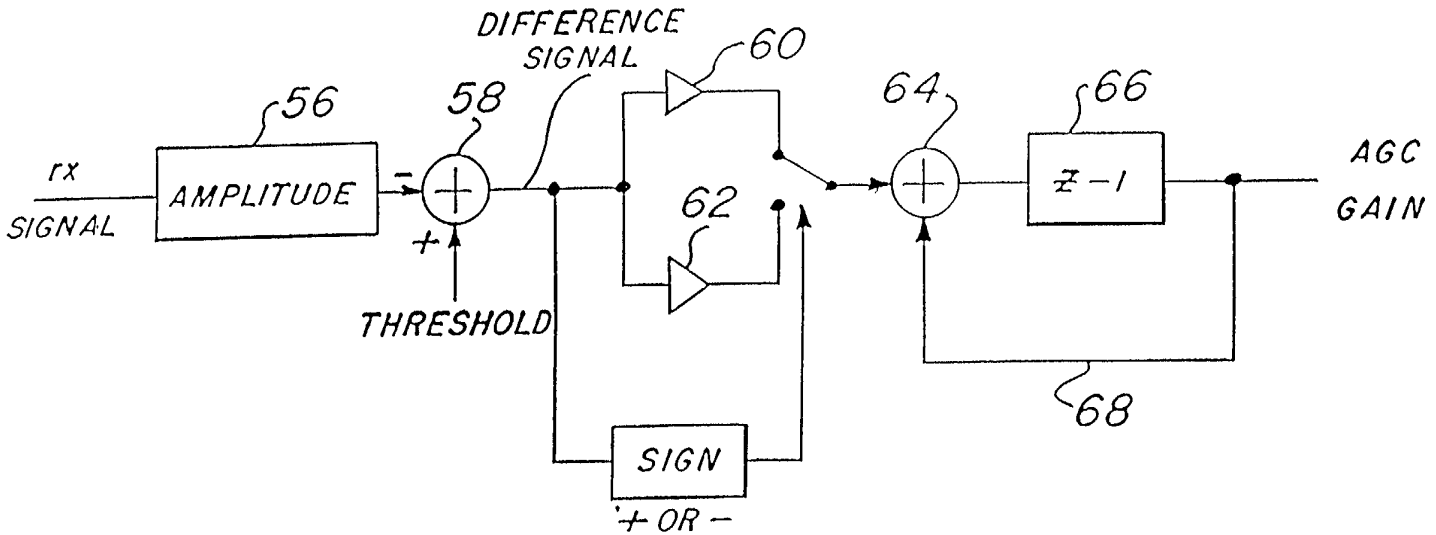


FIG. 6

FIG. 7

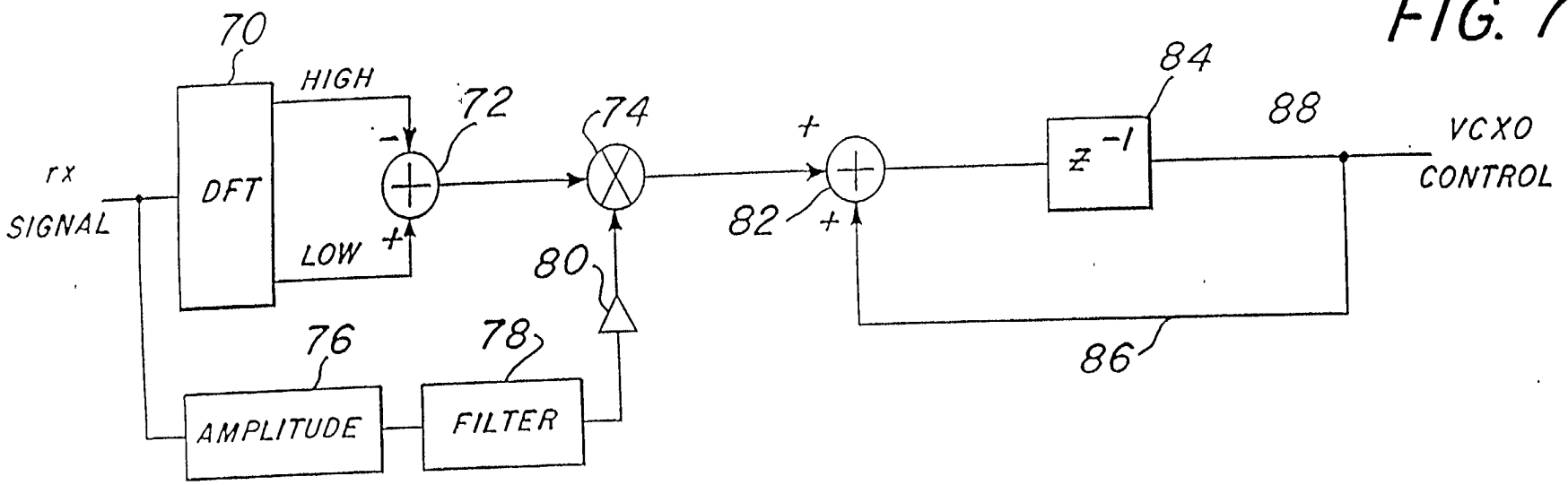


FIG. 8

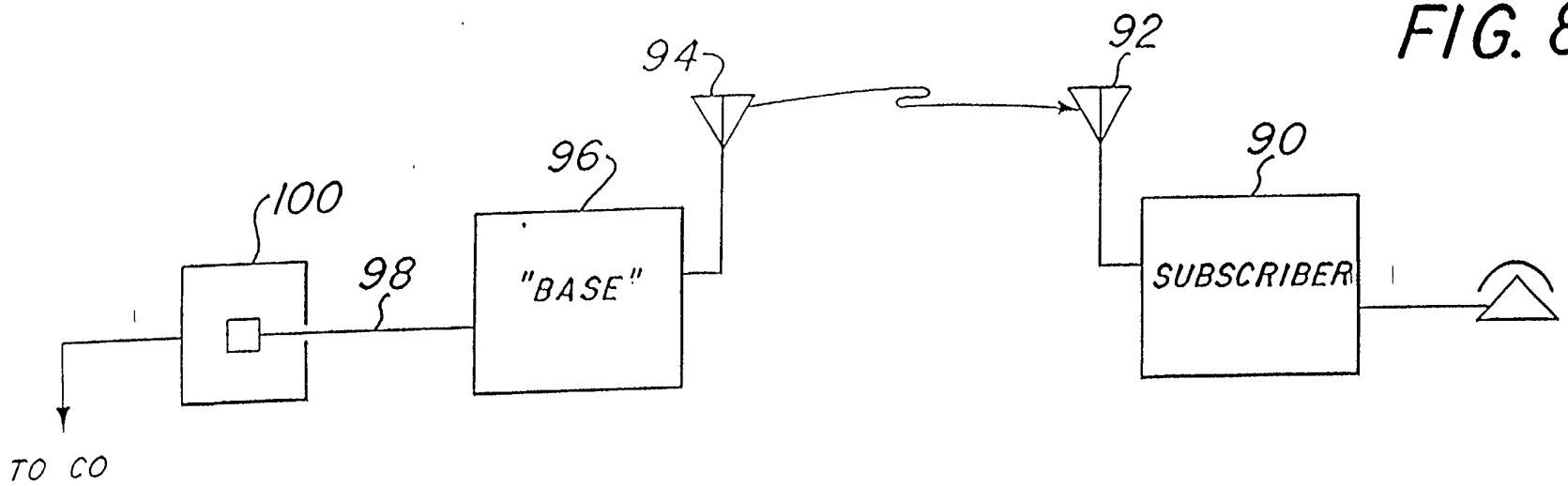


FIG. 9

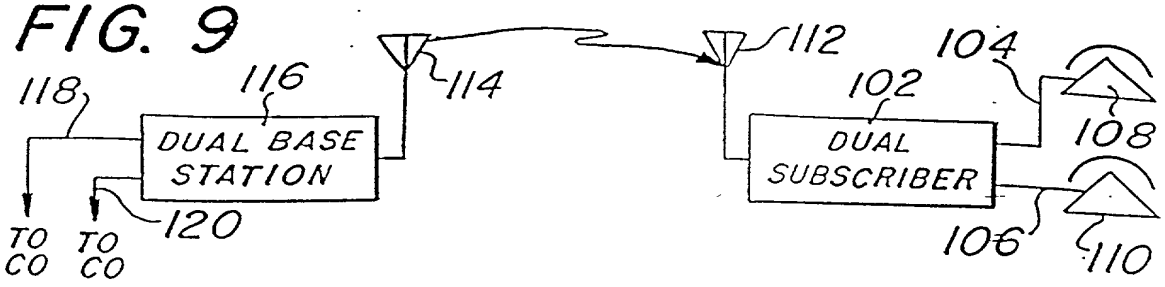


FIG. 10

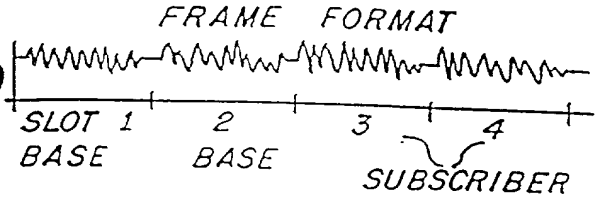


FIG. 11

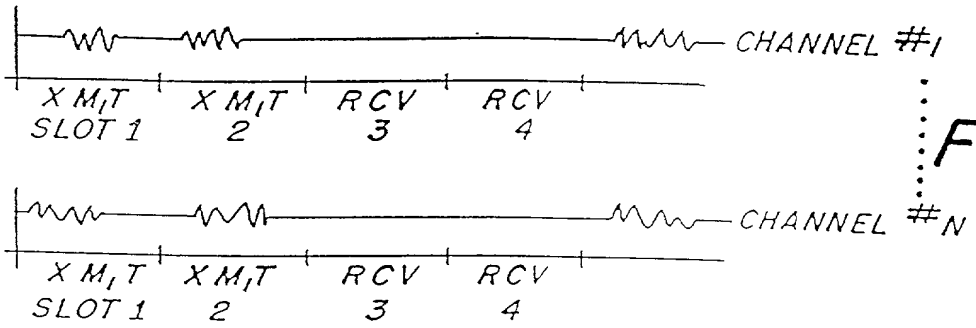


FIG. 12

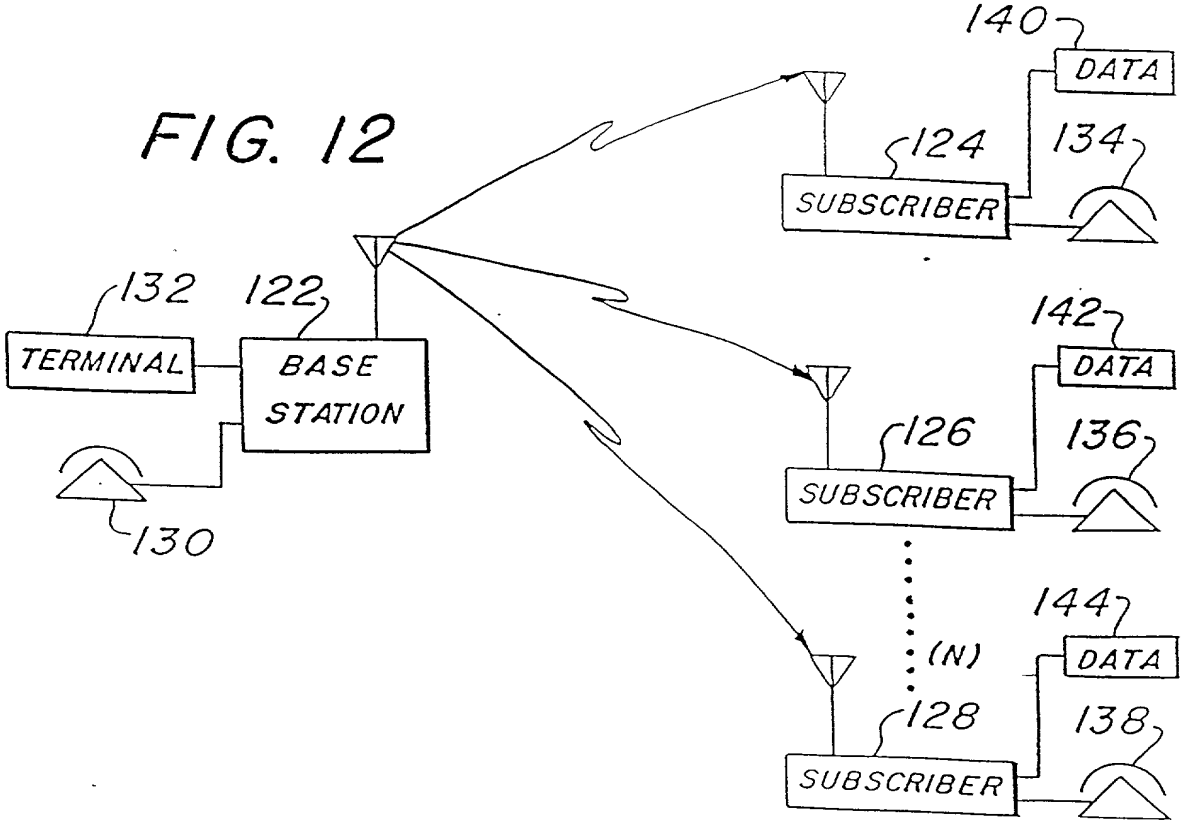
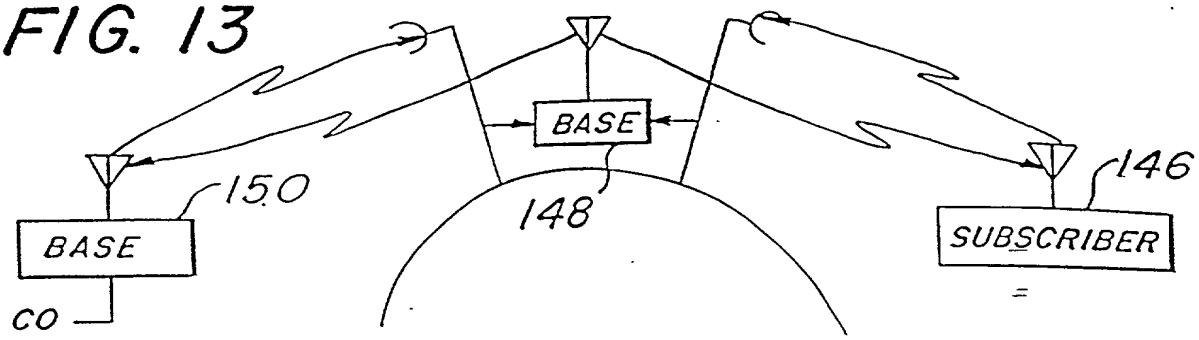


FIG. 13



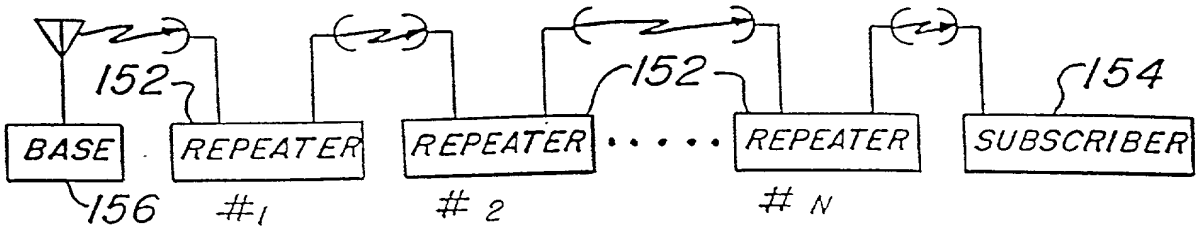


FIG. 14

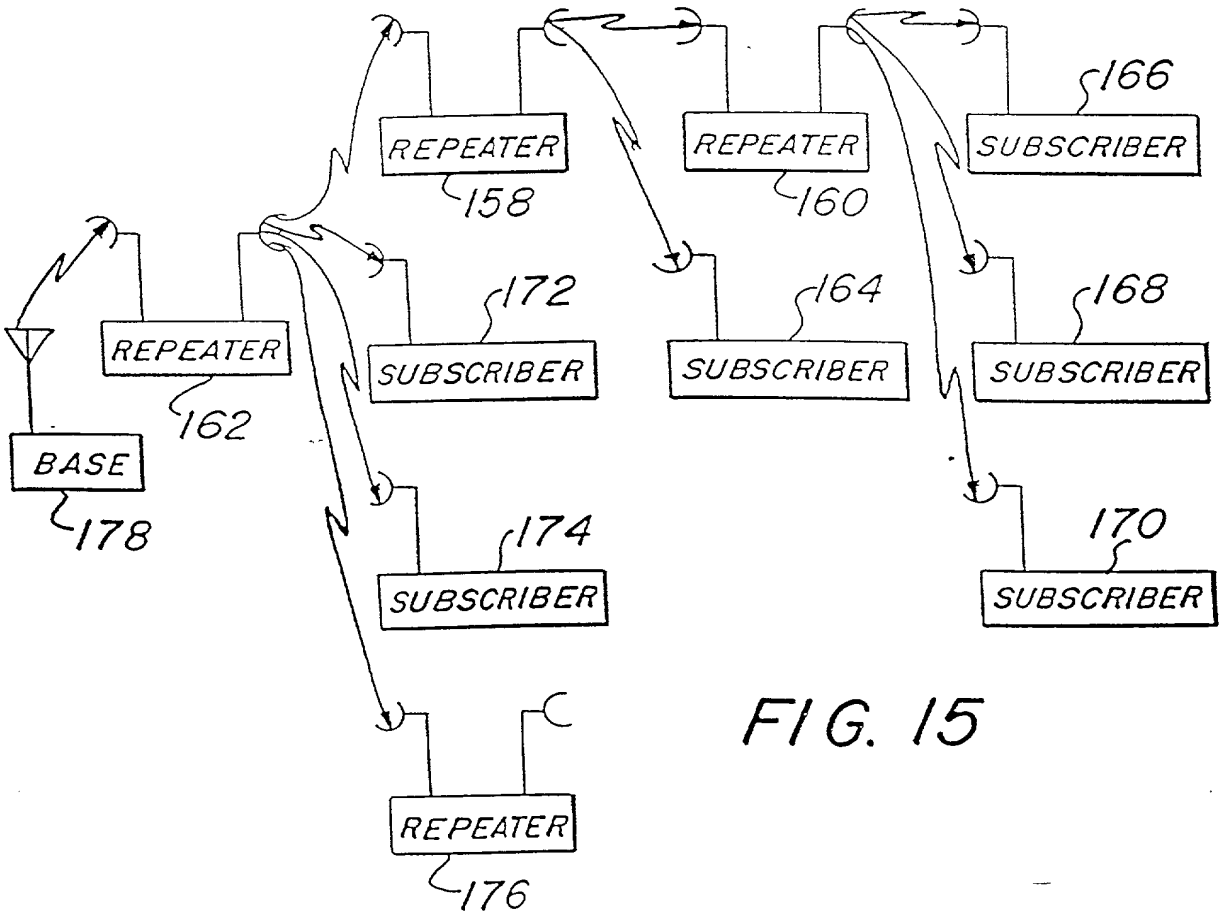


FIG. 15

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D[illegible]RATION FOR PATENT APPLICATION Docket No. I-33

As a below named inventor, I hereby declare that:

My resid[illegible] post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled BASE STATION EMULATOR, the specification of which

(check one) ☒ is attached hereto.
☐ was filed on _____ as
Application Serial No. _____
and was amended on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)			Priority Claimed	
(Number)	(Country)	(Day/Month/Year Filed)	Yes	No
(Number)	(Country)	(Day/Month/Year Filed)	Yes	No
(Number)	(Country)	(Day/Month/Year Filed)	Yes	No

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

(Application Serial No.)	(Filing Date)	(Status—patented, pending, abandoned)
(Application Serial No.)	(Filing Date)	(Status—patented, pending, abandoned)

I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

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Philadelphia, PA 19102

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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Inventor's signature John David Kaewell, Jr. Date November 13 1987
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Second Inventor's signature Scott David Kurtz Date 11-13-87
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Post Office Address 104 West Bluebell Lane
Mount Laurel, N.J. 08054

(Supply similar information and signature for third and subsequent joint inventors.)

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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the **PATENT APPLICATION** of:	
Kaewell, Jr. et al.	Our File: I-1-50.5US
Application No.: Not Yet Known	Date: July 19, 1999
Filed: Not Yet Known	
For: BASE STATION EMULATOR	
Group: Not Yet Known	
Examiner: Not Yet Known	

ASSOCIATE POWER OF ATTORNEY ACCOMPANYING APPLICATION

Box Patent Application
Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

Pursuant to 37 C.F.R. § 1.34, please recognize as an associate attorney or agent in this application the following:

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Respectfully submitted,

Kaewell, Jr. et al.

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CFK/ras